

## NOTES ON PERLIDÆ<sup>1</sup>

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### 1. PERLESTA

The species of *Perlesta* are of moderate size; they have three ocelli; the antennæ have basal joints as long as broad, with many fine appressed hairs, each joint with one or more longer erect hairs (sense hairs). The femora have not only fine hairs below but also longer bristles scattered among the hairs (most noticeable on the front femora). In the fore wings the anal cell at base of wings gives rise on the lower edge to a recurrent vein (the anal brace), the anal lobe is small, but, with the wings spread, readily seen, and the outer part of the anal brace crosses it; in the hind wings there are usually several cross-veins in the cubital area, but sometimes only one besides the end cross-vein and rarely only the end cross-vein; there are no cross-veins in apical part of wings, except in costal area. The setae are rarely as long as the abdomen, with many stout hairs, and near tip of each joint one or two much longer erect hairs, often as long as the joint, the first few joints are hardly longer than broad, but soon the joints are extremely long. The last joint of maxillary palpi is usually hardly one-half of the third joint. The V-mark is two slightly diverging arms, quite broad throughout and reaching about half way to the front margin. The genotype is *Perla placida* Hag.

*Perlesta placida* Hag. is common at and near Washington, and is found generally from Canada to Louisiana, east of the Appalachian Mountains, except in New England. Normally it has a pale yellowish head, with a shining black spot covering the ocelli, but not extending to the front of head; the pronotum is brown to yellowish brown, sometimes with a pale median stripe; the thorax, abdomen and legs are yellowish; the wings are clear, the veins pale or

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pale brown. Specimens with only a black bar connecting the hind ocelli were described by me as *P. virginica*; it is only a color form. Specimens without any black on head were named *P. immaculata* by Klapalek, this also is a color form. All of these have the genital prongs in the male very slender, usually near each other and each curved outward toward tip; the subgenital plate shows two lobes with truncate tips.

In 1862 Walsh described two species from Rock Island, Illinois; he put each in a separate subgenus, since one had but one branch to radial sector and the other had two branches. *P. decipiens* and *P. brunneipennis* usually have the black spot covering the ocelli, *decipiens* has clear wings, *brunneipennis* has infuscated wings. The genital prongs are very similar but quite different from *P. placida*, being much stouter and bent near the middle.

I consider that these two forms represent but one species, *P. decipiens*. It is the common form in the mid-west from Michigan to northern Texas. However there is a black species in this area, much less common, this is *Perlesta cinctipes* Bks. The body and wings are almost wholly black, the edge of the clypeus usually whitish, the legs are pale beneath, the setae are pale, but each joint has a dark band at tip, the hind femora are pale at base and tip, and at tip of hind tibiæ. The legs of this species are shorter and much less slender than in the other species, particularly noticeable in the hind femora. The pale of costal margin is reduced, each end of costal area being dark. In the female the subgenital lobes are large and the tips plainly rounded. In the male the genital prongs are very slender and longer than in *placida*, not, or scarcely outcurved at tips.

In 1914 I described another species, *P. texana* from Texas (Dallas, Kerrville, Victoria, Devil's River). It is yellowish to rufous, the ocelli faintly connected by a dark V-mark; legs are pale below with a brown streak above, the hind tibiæ dark except near tip; hind femur fairly slender; sides of ocellar triangle longer than base. In the male the genital prongs are moderately slender, slightly outcurved toward tip, and their bases separated by a basal

width. In female the prongs are extremely broad at base, and with a short point, or slender peg at inner corner. Each lobe of the subgenital plate is rounded, but not as hairy as in *nitida*.

Besides the four species mentioned are two new species; one from the streams on the higher slopes of the Smokies, and another the only form seen from New England.

#### *Perlesta placida nitida* new race

Head and thorax above black, shining, on head there is a pale yellowish spot between eye and hind ocellus, and on margin over base of antennæ the ridge is yellowish, sometimes the spot by the eye is smaller, or almost gone, and the ridge only partly yellowish; abdomen dull black above, below paler on venter, and on sternum dull yellowish, also on under side of legs, above on legs brown to black, tarsi black; antennæ dull yellowish on basal third of fourth, beyond brown; setæ yellowish on first five or six joints, then more or less brown to blackish on basal half to three-fourths with the tip pale, further out the joints are wholly black. Wings blackish, costal area pale yellowish, veins black.

Structure similar to *placida*; hind ocelli a little nearer to eyes than to each other, lateral boss transverse and placed as in *placida*; pronotum in female about twice as broad as long, in male not so broad, narrowed behind, with strong rugæ on each side; hind femora fully as slender as in *placida*, much more slender than in *cinctipes*, the western black species.

The male genital prongs are shorter, more straight than in *placida* and the apical third is the only narrow part; in the female there is a very broad part for the basal three-fourths and at inner tip a short, slender apical part. The subgenital plate has two lobes, each lobe strongly rounded on tip instead of the truncate lobes of other species; these and the apical margin of the ninth segment have many long hairs, more than usual. The V-mark shows two pear-shaped bodies, with a long stem toward the front ocellus.

Expanse 18 mm.

Two females and male from Holliston, Mass., 22, 30 June, 1 July. One male from Pittsfield, N. H., 5 July

(Bks. coll.). Also three from Connecticut; So. Meriden 17 June, 4 July (H. L. Johnson), and Mt. Carmel, 2 Aug. (Sommermann) (teneral), in the Agric. Exper. Station, New Haven.

Type M.C.Z. no. 27673.

*Perlesta frisoni* sp. nov.

This is the species occurring in the higher parts of the mountains of North Carolina and eastern Tennessee. It is pale yellowish, no dark spot over ocelli; the pronotum yellowish, but with more or less definite brown marmorations on the sides, sometimes making a broad pale brown band each side; below wholly pale, the legs and setæ also pale, sometimes the hind tibiæ are slightly darkened at base above; wings wholly clear, none at all fumose. Antennæ pale on basal fifth or more, beyond dark. The head and pronotum are a little broader than *placida*, the ocellar triangle not as long as in *placida*, the hind ocelli plainly nearer to eyes than to each other, the lateral boss is transverse and about the diameter of an ocellus and below the ocellus.

The V-mark shows two strongly diverging arms, at upper end pointed, at tip very broad, the inner edge concave.

The pronotum in front is not nearly twice as broad as long, and plainly narrowed behind; the anterior angles are quite sharp, and the front margin more strongly bowed than in *placida*.

The genital prongs of the male are broad at base and taper gradually on both sides to the fairly sharp tip. In the female the base of each prong is much broader, the inner tip prolonged into a short, slender point, sometimes very slender like a peg.

In the female the subgenital plate is transverse and truncate, sometimes a median notch, the apical plates (between bases of setæ) are more prominent, and more sharply pointed than *placida*, not so hairy as in *nitida*.

Many specimens from the Smoky Mts., mostly on the Tennessee side in early September, 1930 (Darlington, Carpenter, Banks).

Expanse 19–24 mm.

Type M.C.Z. no. 27662.

## 2. NEOPHASGANOPHORA AND HARRISIOLA

Failing to examine the genital prongs of the several species proposed in this genus N. & C. lumped all under *Perla capitata* Pictet, the type of the genus. I did not find the type specimen of the species in Europe in 1912, and Ricker does not mention seeing it. Pictet says he had a male; if it were a *Neophasganophora* he could hardly help seeing and referring to the genital prongs, so much larger than in other *Perlidae*. His specimen might well be a species much like, but paler than *media*. *Media* is largely black on the head; this similar form, smaller and paler than *media* has a head largely yellowish with a black spot over the ocellar area and a median triangular black mark on the lower face, exactly as Pictet figures *capitata*. This form belongs to *Perla* (or *Togoperla*) and the male has only small genital prongs and often in dried specimens are depressed in the cavity, so as scarcely noticeable. Therefore I replace *Neophasganophora* of Needham with *Harrisiola*, and *Perla flavescens* Walsh as genotype. *Harrisiola* is readily separable, in the male from *Perla* or *Togoperla* by the elongate genital prongs, but both sexes are also separated by the course of the occipital line; in *Harrisiola* the ends of the occipital line bend forward close to the outer edge of the lateral bosses; in *Perla* (*Togoperla*) the line passes well above the lateral boss toward the eye.

In the synoptic table of the species below I have used color, for I find that where we have a number of specimens and from various localities, the color of setæ, of hind femora, and the type of head marking is the same throughout, and that they follow the shape of the male genital prongs, and therefore when specimens, tho few, show differences in these points I treat them as distinct species.

The figure of the genital prong given by Klapalek is not like that of the Loudonville specimens I sent him; and the figures of Needham and Claassen (Plate 19, figures 1 and 2) are not at all the common *flavescens* but probably of *H. americana*, and the female (fig. 3) also fits this species.

1. Hind femora mostly pale, with a broad black band across near base; several joints near base of setæ

pale; apical part of genital prongs divided by a constriction, the outer part slender toward tip; the fifth dorsal segment projecting in a fairly broad lobe.

*annulipes.*

- Hind femora without a band near base, but often an elongate spot not reaching across ..... 2.
2. Hind femora (and others) with upper side black and lower edge with a dark line, sometimes incomplete; setæ wholly black except extreme base of first segment; produced part of fifth dorsal segment broad behind, lightly rounded; last section of genital prongs very long and slender ..... 3.
- Hind femora (and others) with upper side partly or wholly dark, lower without dark; tip of produced part of fifth dorsal segment not so broad; last section of genital prongs often shorter ..... 5.
3. Base of fore wings plainly yellowish, wings pallid; hind corners of head yellow; femora with dark streak above and below; last section of genital prongs scarcely, if at all, scabrous above ..... *flavescens.*
- Base of fore wings not plainly yellowish, but more or less darkened ..... 4.
4. Base of fore wings plainly black, and general surface and veins darkened; head black except a pale dot on each boss and on bases of V-mark; femora almost wholly black, a pale streak on side toward end; apical part of prong scabrous and as long as in *flavescens*; setæ black ..... *nigrescens.*
- Base of wings not so dark, head with hind corners yellowish as in *flavescens*; wings and veins almost as dark as in *americana*; at least basal half of setæ pale yellowish; apical part of prongs quite short
- abbreviata.*
5. Apical part of prongs almost as long as in *flavescens* and not scabrous above; setæ almost wholly pale, scarcely any dark on abdomen; wings an even dull yellowish brown, no pale base ..... *tristis.*
- Apical part of prongs much shorter, often scabrous above, setæ with only a few joints toward base pale ..... 6.

6. Last part of prongs about three times as long as broad, not scabrous, just before tip with a few distinct spicules or short spines; setæ entirely black; pro-meso- and metanotum with an elongate pale spot, tips of femora broadly black across ..... *modesta*.  
Last section of prongs scarcely more than twice as long as broad, tip more pointed; no pale marks on thorax above ..... 7.
7. Preapical part of prongs but little longer than apical part ..... *klapaleki*.  
Preapical part of prongs fully twice as long as the apical part ..... *americana*.

*Harrisiola flavescens* Walsh

This species, easily recognized by the yellowish base to fore wings, is typically from Illinois, but the eastern *marginipes* Provancher is the same species, and occurs from southern Canada down to Washington, D. C. The eastern forms are sometimes a little darker, but the prongs are like those of a Walsh paratype at the M.C.Z. *Perla illustris* Bks. and *P. innota* are synonyms of *marginipes*.

Paratype M.C.Z. no. 10127.

*Harrisiola nigrescens* sp. nov.

Head and thorax both above and below largely black, with only bosses and a spot on each arm of the V-mark pale, under side of head with a few pale spots, hind part of metasternum pale, abdomen mostly rufous, last five segments with a black apical mark over the posterior part, some on dorsum but more on sides and venter, not nearly reaching middle of venter; the sixth and seventh ventral segments show a median dark area, not as prominent as in *flavescens*; setæ jet black, palpi black, antennæ mostly black, but the basal fourth more or less pale; wings with very distinct dark veins, basal costal area before first cross-vein black, no sign of the yellowish base of *flavescens*; area of anal cell, some in front and beyond also black. Legs mostly black, femora with an elongate pale streak on outer half before tip, tibiæ more brown, but tarsi black.

The fifth segment of male is prolonged about as in *flavescens*, but not such a broad tip; the last section of the genital prongs is long, but not quite as long as *flavescens*, and without any little spinules; last section longer than in *tristis*.

Length of body, 12 mm.; of fore wing 13 mm.

Three males from Antrim Co., Mich., 6 July (Dreisbach).

Type M.C.Z. no. 27719.

*Harrisiola annulipes* Hag.

The head has a broad black mark from occipital line to front margin, broken by pale between each hind ocellus and the lateral boss and the arms of the V-mark are rather broadly pale. The femora have a broad band across basal half and a narrow band at tip, the upper and lower edges between are pale. The setæ are pale on several basal joints.

The genital prongs are long, the apical section swollen at base and then slightly constricted beyond from where it tapers to the pointed tip, from above this part is seen to be compressed, the preapical part has fairly large spinules above. In the female the ventral plate is rather strongly rounded, on each side is a rounded dark spot and the outer half of the marginal part is dark, the preceding segment has a dark spot in the middle.

It is not uncommon in the vicinity of Washington, D. C. Also occurs at Easton, Pa., and in Montgomery Co., Pa.

Type M.C.Z. no. 249.

*Harrisiola tristis* Hag.

This was based on two males from Trenton Falls, New York. I have seen no other males like them. The femora are dark along upper edge as in *marginipes*, but the lower edge pale; the setæ are almost entirely pale; there is black between the hind ocelli and bosses. It is a small species, and a female from the Delaware Water Gap is of the same size and may belong to it, with the femora dark above and pale below and pale setæ. The last section of the genital prongs has the upper edge more strongly



curved than in *flavescens*, and, from side, is broader in the middle. The head has a little more pale in front than *flavescens*, venter pale, antennae pale for some distance. The prongs are long, the apical part very long and much curved down, and not scabrous above.

Type M.C.Z. no. 245.

*Harrisiola americana* Bks.

This has the head black behind occipital line, pale each side between hind ocellus and boss, and pale over the V-mark. The genital prongs show a rather short apical part, and long basal part with erect hairs and numerous spicules above, the two parts separated by a strong constriction. The hind femora are partly or wholly dark on upper edge, the lower edge pale; setæ mostly dark, but a few joints at base pale.

Type M.C.Z. no 11324.

*Harrisiola klapaleki* sp. nov.

This is very similar to *americana*, but differs in the much shorter preapical part of the genital prongs. The hind femora have more black on basal part above; but the lower margin is dark only near base.

The female has the ninth segment below black each side, pale in middle, the subgenital plate less convex (not lobed as in *americana*), and black or dark, except for the pale apical depression.

From Loudonville, Ohio, 6 July (Osburn).

Type M.C.Z. no 27717.

*Harrisiola modesta* sp. nov.

Head largely yellow, ocellar area black, and a broad dark band below the V-mark. The pronotum has a pale median streak, not reaching front and broader behind, an irregular pale spot on middle of meso- and metanotum. Tip of femora broadly black across; setæ entirely black; last ventral segment (9) has a dark spot each side near outer margin; wings mostly blackish.

Last section of genital prongs much shorter than in *flavescens*, about three times as long as broad (from side)

not, or scarcely broadened in middle, nearly cylindrical, not scabrous above, but tip of preapical part with a few spinules.

From Marietta, Ohio, 7 June (Holden).

Type M.C.Z. no. 27718.

#### *Harrisiola abbreviata* sp. nov.

Head marked much as in *flavescens*, the hind corners yellow; femora with a black streak above near base and another near tip, lower edge narrowly black, hind tibia almost wholly pale; wings and veins darkened, almost as much as in *americana*, no flavescent base; venter with dark side and two dark spots in the middle; antennæ dark; setæ with at least basal half pale yellowish.

Genital prongs with the apical part much shorter than in *flavescens*, and not scabrous above, but preapical part has a few spinules near tip above.

A little smaller than *flavescens*.

Taken near Grand Gorge in the Catskill Mts., N. Y., in the latter part of June 1889 (Bks).

Type M.C.Z. no. 27720.

### 3. SOME NEW SPECIES

#### *Pictetia bimaculata* sp. nov.

Brown marked with pale yellowish, ocelli joined by fairly broad, almost black lines, a pale yellowish triangle within, laterally, each side of the front ocellus the dark is extended nearly to the margin of head. Most of the middle of face is a paler brown as in figure, pale yellow on bosses and over and between the V-mark. Head between eyes convex and here broader than long, behind eyes the sides curve inward; ocelli in triangle about one and one-third times as broad as long, hind ocelli scarcely as near to eyes as to each other; palpi brown, maxillary palpi very slender, third and fourth joints about equally long and each about as long as an eye. Antennæ black, fourth and fifth joints each broader than long, clothed with short, pale hair and near end of each joint the very short, erect sense hair.

Pronotum not quite twice as broad in front as long, anterior side plainly convex, anterior corners projecting a little, behind much narrower than in front, with a broad, pale median stripe, and each side including margin, dark brown; inner two-thirds of each side with short, irregular ridges; rest of thorax black above, brown below; legs rather evenly pale brownish, tarsi black; abdomen dull brown above and below, ninth ventrite with a rounded, swollen black spot each side; ventral plate broad, and broadly rounded.

Wings faintly tinted, veins not very dark, anal cell about twice as long above as broad at tip; anal brace reaches from near base of cell across anal area, but no anal lobe here; cubito-anal cross-vein plainly its length beyond cell, not darkened; subcosta ends some distance before cord, only a few costal cross-veins, and one beyond cord; radial sector forks once not far beyond cord; in hind wings no extra cubital cross-veins; abdomen fully as long as head and thorax.

Length of body 12 mm.; of fore wing 12 mm.

From Digby, Nova Scotia, 28 May 1905 (Russell).

Type M.C.Z. no. 27723.

#### *Atoperla consors* sp. nov.

Head dark brown; only the antennal ridge opposite antennæ and the basal part of the V-mark pale; palpi brown; antennæ pale on basal part, soon becoming brown. Legs dull yellowish brown, tarsi darker; thorax and abdomen dark brown, setæ pale yellowish.

Head only a little longer than broad, not as much longer as in *ephyre*; dark spots on ninth ventrite sometimes showing; wings fully as slender as in *ephyre*.

Ventral plate of female shows a median broad V-line, and from each end a line at first curving in and then rounding out, with outline of a square in the middle, otherwise very similar to *A. ephyre*.

Length body 8 mm.; of fore wing 10–11 mm.

From Kingston, R. I., 23 June (Barlow); Pittsfield, N. H., 5 July (Bks). Differs in the almost uniformly dark

head, which is a little shorter, and in details of the ventral plate.

Type M.C.Z. no. 27722.

***Neoperla clymene* subsp. *mainensis* nov.**

This form differs radically from the common form in the blackened body and wings; head and thorax deep black, sometimes a little rufous each side of anterior ocellus; antennæ mostly black, a few joints beyond second paler. Wings with black veins and the membrane infusate, even the costal border of fore wing is black at base and beyond scarcely yellowish, only not as dark as rest of wing; abdomen black above and below, extreme tip above in genital area paler; femora dark brown to black, the lower edge paler; setæ pale, with dark at tips of joints, and farther out wholly black.

The ocelli are a little more separated than is usual in *N. clymene*. The genital prongs, instead of slightly evenly curved, are bent so that the apical part is parallel to its fellow; the slender conical process on the seventh dorsal segment is longer than in typical *clymene*, and extends over most of the next segment.

Type M.C.Z. no. 27725.

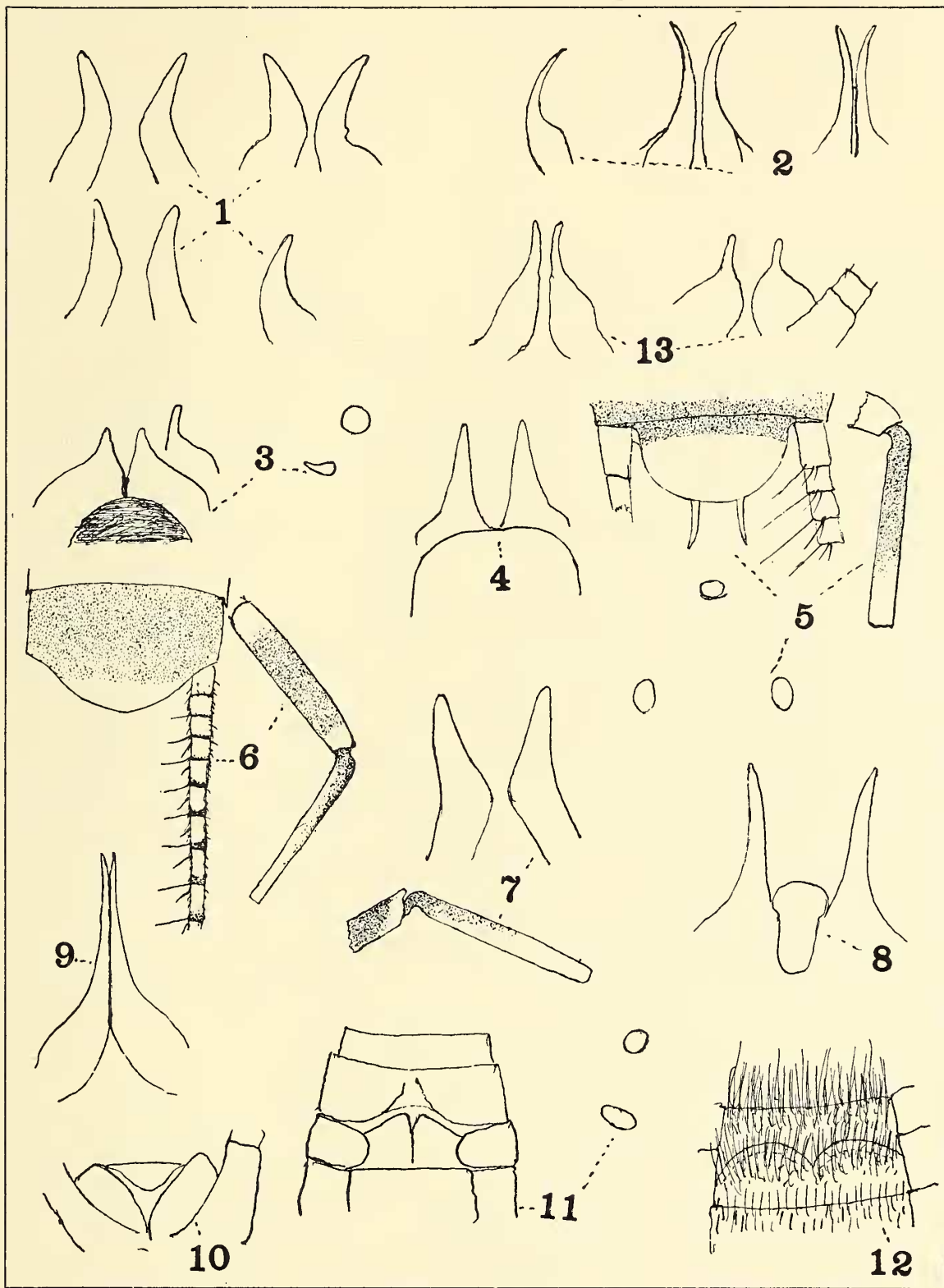
Mr. A. Loveridge has taken numerous specimens of this black form at Rome, Maine, 26 June to 8 July.

***Peltoperla nigrisoma* sp. nov.**

Body above and below jet black, except a pale yellowish triangular spot over anterior corners of face from eye

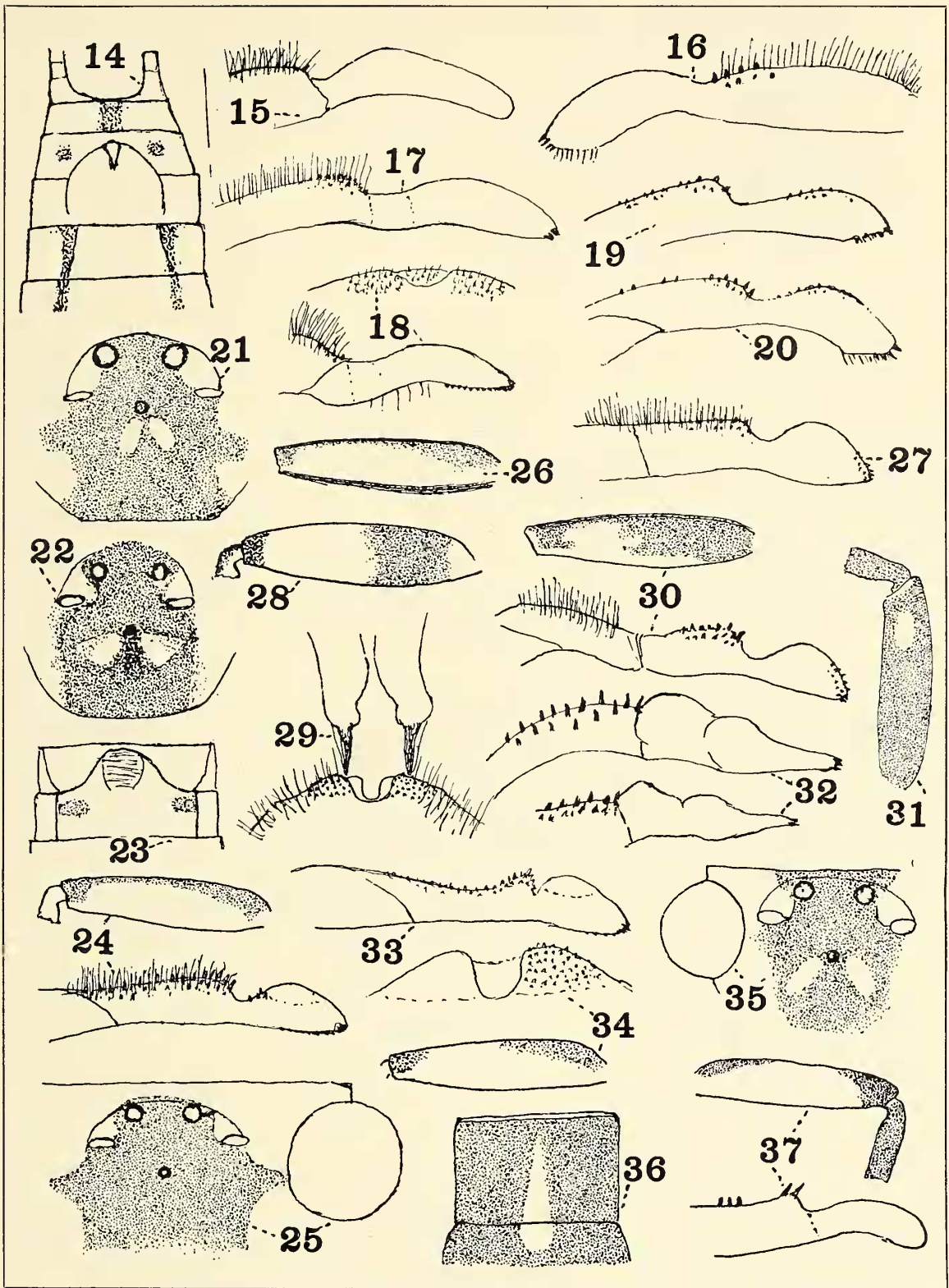
EXPLANATION OF PLATE 11

- Fig. 1. *Perlesta decipiens*, male genital prongs, and one from side.  
 Fig. 2. *Perlesta placida*, male genital prongs, and one from side.  
 Fig. 3. *Perlesta frisoni*, female anal plates, and ocellus and boss.  
 Fig. 4. *Perlesta frisoni*, male genital prongs.  
 Fig. 5. *Perlesta texana*, tip of abdomen, ocelli, and hind tibia.  
 Fig. 6. *Perlesta cinctipes*, tip of abdomen, seta, hind femur and tibia.  
 Fig. 7. *Perlesta brunneipennis*, male genital prongs, and hind tibia.  
 Fig. 8. *Perlesta texana*, male genital prongs.  
 Fig. 9. *Perlesta cinctipes*, male genital prongs.  
 Fig. 10. *Perlesta placida*, tip of female abdomen from below.  
 Fig. 11. *Perlesta frisoni*, subgenital plate of female, and ocellus and boss.  
 Fig. 12. *Perlesta nitida*, subgenital plate.



## EXPLANATION OF PLATE 12

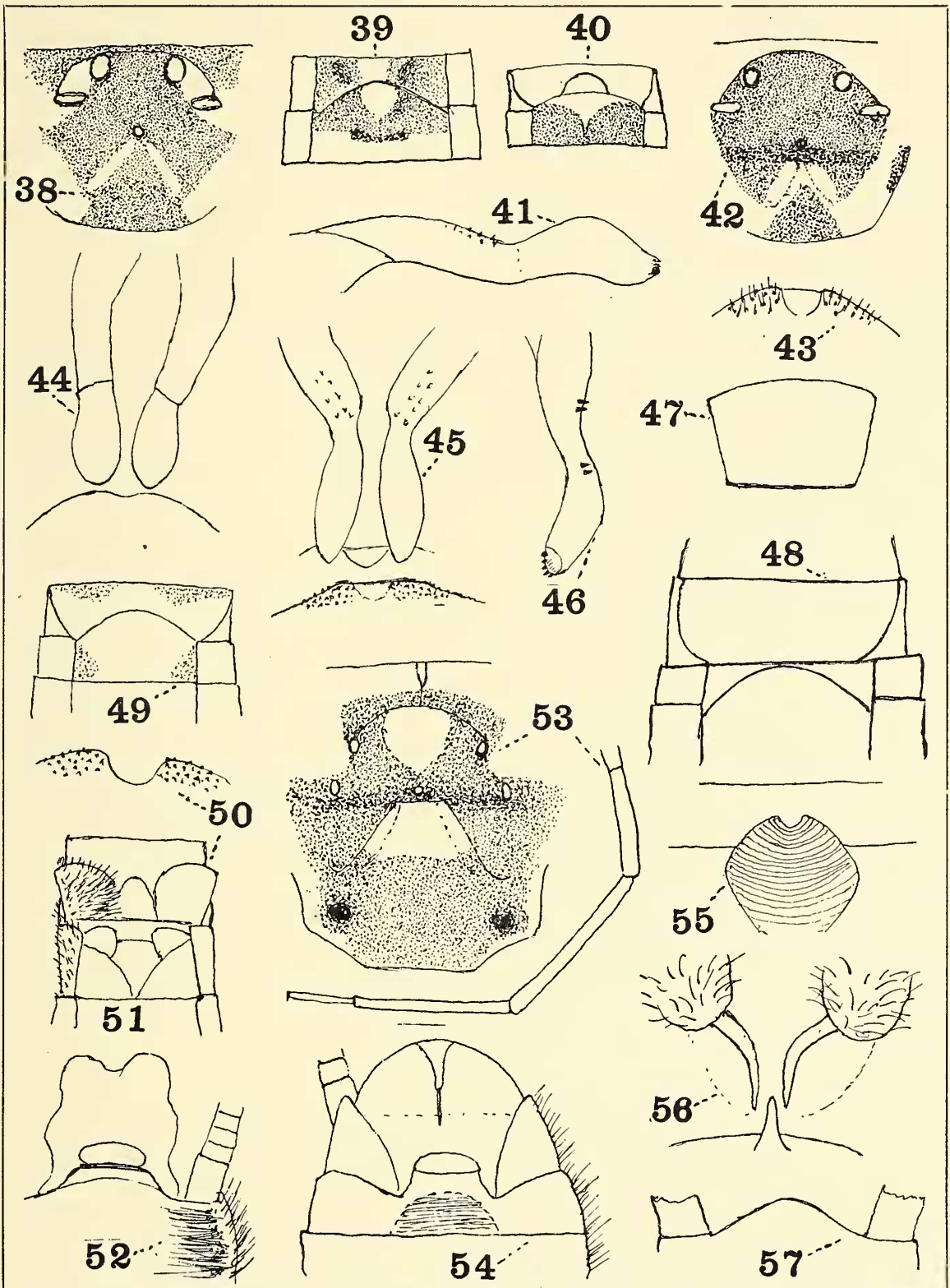
- Fig. 13. *Perlesta nitida*, (left) prongs of male, (right) of female.  
Fig. 14. *Harrisiola flavescens*, venter of female.  
Fig. 15. *Harrisiola flavescens*, genital prongs of paratype.  
Fig. 16. *Harrisiola tristis*, genital prong.  
Fig. 17. *Harrisiola flavescens*, genital prong of marginipes form.  
Fig. 18. *Harrisiola flavescens*, prong from another view and edge of fifth segment.  
Fig. 19. *Harrisiola nigrescens*, genital prong.  
Fig. 20. *Harrisiola nigrescens*, genital prong, another view.  
Fig. 21. *Harrisiola flavescens*, face.  
Fig. 22. *Harrisiola annulipes*, face.  
Fig. 23. *Harrisiola americana*, ventral plate.  
Fig. 24. *Harrisiola americana*, femur and genital prong.  
Fig. 25. *Harrisiola modesta*, face.  
Fig. 26. *Harrisiola marginipes*, femur.  
Fig. 27. *Harrisiola klapaleki*, genital prong.  
Fig. 28. *Harrisiola annulipes*, femur.  
Fig. 29. *Harrisiola annulipes*, ends of prongs, and tip of fifth segment.  
Fig. 30. *Harrisiola klapaleki*, femur and genital prong.  
Fig. 31. *Harrisiola nigrescens*, femur.  
Fig. 32. *Harrisiola annulipes*, genital prongs.  
Fig. 33. *Harrisiola americana*, genital prong and tip of fifth segment.  
Fig. 34. *Harrisiola americana*, femur.  
Fig. 35. *Harrisiola klapaleki*, face.  
Fig. 36. *Harrisiola modesta*, pronotum.  
Fig. 37. *Harrisiola modesta*, femur, and genital prong.



## EXPLANATION OF PLATE 13

- Fig. 38. *Harrisiola abbreviata*, face.
- Fig. 39. *Harrisiola klapaleki*, ventral plate.
- Fig. 40. *Harrisiola tristis*, ventral plate.
- Fig. 41. *Harrisiola abbreviata*, genital prong.
- Fig. 42. *Harrisiola tristis*, face.
- Fig. 43. *Harrisiola modesta*, tip of fifth segment.
- Fig. 44. *Harrisiola abbreviata*, prongs from above.
- Fig. 45. *Harrisiola marginipes* form, prongs from above.
- Fig. 46. *Harrisiola modesta*, genital prong.
- Fig. 47. *Pictetia bimaculata*, pronotum.
- Fig. 48. *Pictetia bimaculata*, ventral plate.
- Fig. 49. *Perla capitata*, ventral plate.
- Fig. 50. *Harrisiola abbreviata*, tip of fifth segment.
- Fig. 51. *Atoperla consors*, venter of female.
- Fig. 52. *Peltoperla nigrisoma*, tip of abdomen above.
- Fig. 53. *Pictetia bimaculata*, face, and maxillary palpi.
- Fig. 54. *Peltoperla nigrisoma*, tip of abdomen below.
- Fig. 55. *Neoperla clymene mainensis*, ventral plate.
- Fig. 56. *Neoperla clymene mainensis*, genital prongs.
- Fig. 57. *Neoperla clymene mainensis*, tip of abdomen above.





down, and the hind border of pronotum is whitish. Wings pale brown, veins a darker brown; femora dull yellowish brown, tibiæ scarcely darker except tip is black, as also tarsi. Antennæ nearly all black except pale toward base. Abdomen with erect short hair below, and on lower sides with much longer hair, usually turned inward from each side, upper sides with some short, erect hair. The wings are much like others; radial sector forked once, no cubital cross-veins in hind wings, thirteen costals before end of subcosta. The head is not quite as short as in *brevis*, hind ocelli a little nearer to each other than to eyes. The ninth ventrite has a transverse knob about two and one-half to three times as broad as long.

Length of body 7 mm.; of fore wing 9 mm.

From Sequoia Park, California, 5000 ft., 6 June (Melander).

Type M.C.Z. no. 27724.